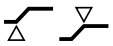
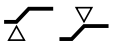
Centrifuge 5702 / Centrifuge 5702 R / Centrifuge 5702 RH

eppendorf

Centrifuge 5702 / 5702 R / 5702 RH

Tastenkürzel / Shortcuts

Task	Lid	Press	Display 5702	Display 5702 R / 5702 RH	Instruction manual
Parameter change during centrifugation	closed	short > 2 sec	Display flashes 5 sec	Display flashes 5 sec	3.8
Brake ON / OFF	open	short > 5 sec	br on br OF	br on br OF soft	3.12
Signal ON / OFF	open	open > 2 sec	b on b OF		3.14
Parameter lock ON / OFF	open	short + open > 2 sec	Lo on Lo OF		3.15
Program (only Centrifuge 5702 R / RH)		1. set parameter 1 or 2 > 2 sec	–	prog 1 prog 2	3.16
At set rpm	open	time > 2 sec			3.13

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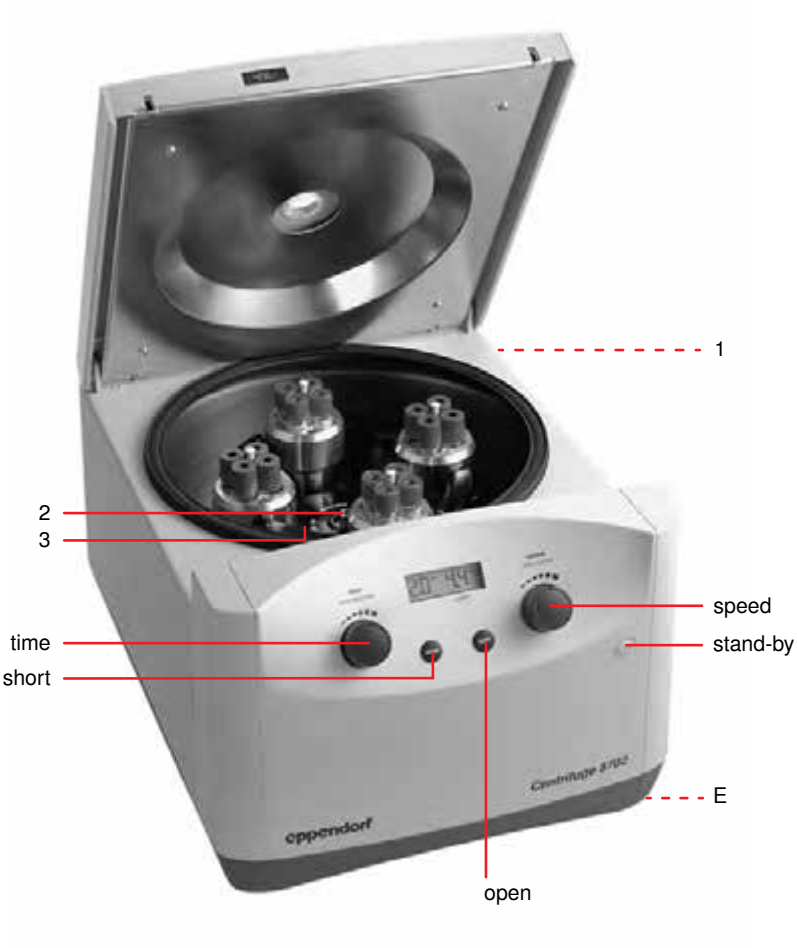
Centrifuge 5702

Abb. 1 / Fig. 1

Abbildung 1 / Figure 1

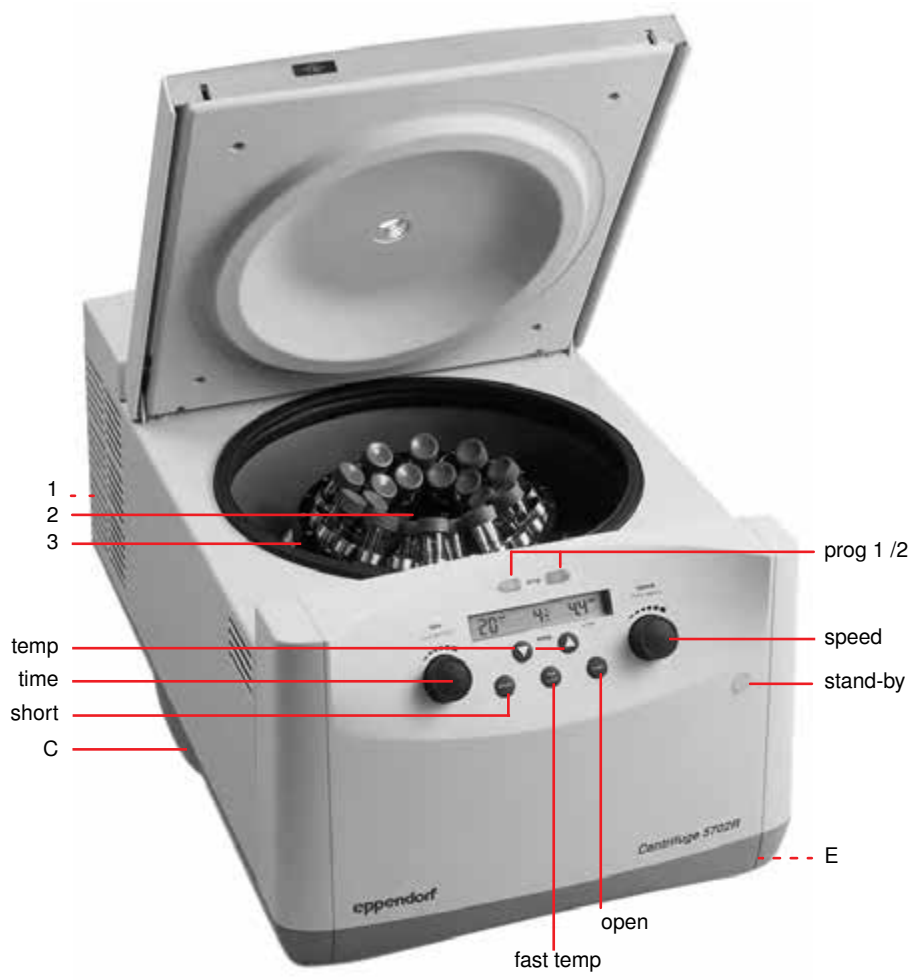


1	Netzschalter und -stecker	1	Mains switch and plug
2	Rotormutter	2	Rotor nut
3	Rotor	3	Rotor
E	Notentriegelung	E	Emergency lid release

Centrifuge 5702 R

Abb. 2 / Fig. 2

Abbildung 2 / Figure 2



1	Netzschalter und -stecker	1	Mains switch and plug
2	Rotormutter	2	Rotor nut
3	Rotor	3	Rotor
E	Notentriegelung	E	Emergency lid release
C	Kondenswasserschale (nur 5702 R)	C	Condensation water tray (only 5702 R)

Front Centrifuge 5702 RH baugleich mit Centrifuge 5702 R.
Front of the Centrifuge 5702 RH is structurally identical to that of the 5702 R.

Contents

1 Introduction 25
1.1 Intended use 25
1.2 Delivery package 25
1.3 Installing the device 25

2 Safety precautions and applicational limitations 26

3 Operation 28
3.1 Functional and operator control elements 28
3.2 Fitting and removing the rotors 28
3.3 Loading the rotors 28
3.4 Fixed-angle rotors 29
3.5 Swing-bucket rotors 30
3.6 Operation of round bucket with aerosol-tight caps 31
3.7 Centrifugation with timer setting 31
3.8 Changing the centrifugation parameters during the run 31
3.9 Short centrifugation 31
3.10 Continuous running 32
3.11 Rcf display and calculation 32
3.12 Adjusting the acceleration and braking ramps 33
3.13 At set rpm 33
3.14 Activating and deactivating the signal tone 33
3.15 Parameter lock 33
3.16 Programming (for 5702 R / 5702 RH only) 34
3.17 Program selection (for 5702 R / 5702 RH only) 34
3.18 Refrigeration (for 5702 R only) 34
3.19 Heating and refrigeration (only for 5702 RH) 35
3.20 Opening the centrifuge in case of power failure 35
3.21 Device fuses 35

4 Maintenance and cleaning 36
4.1 Device 36
4.2 Rotors 36
4.3 Refrigerated centrifuges 36
4.4 Glass breakage 37
4.5 Returning devices 37

5 Troubleshooting guide 38

6 Technical data 39

7 Ordering information 40

1 Introduction

Centrifuge 5702 is non-refrigerated, Centrifuge 5702 R is refrigerated and Centrifuge 5702 RH is a refrigerated and heatable bench-top centrifuge. For these centrifuges following rotors are available:

Fixed-angle rotor F-35-30-17	with a capacity of 30 x 15 ml centrifuge tubes.
Fixed-angle rotor F-45-24-11	with a max. capacity of 24 x 1.5 / 2.0 ml in micro test tubes.
Fixed-angle rotor F-45-18-17-Cryo	with a max. capacity of 18 x cryotubes (max. ∅ 17 mm).
Swing-bucket rotor A-4-38	with a max. capacity of 4 x 85 ml in round buckets and 4 x 90 ml in rectangular buckets.
Swing-bucket rotor A-8-17	with a max. capacity of 8 x 15 ml.

Before using the centrifuge 5702 / 5702 R / 5702 RH for the first time, please read the operating manual. The latest version of the manual and the safety instructions in your language can be found on the Internet at www.eppendorf.com.

You will see this symbol on your centrifuge and at a number of points throughout this manual. The texts it highlights are relevant to safety. Use the centrifuge only after having read the safety notices.

1.1 Intended use

The Centrifuge 5702 / 5702 R / 5702 RH is intended exclusively for indoor use and for separating aqueous solutions and suspensions of various densities in approved test tubes.

This device may only be operated by trained specialist staff. They must have carefully read the operating manual and be familiar with the function of the device.

1.2 Delivery package

1 Centrifuge 5702 non-refrigerated or 1 Centrifuge 5702 R refrigerated with condensation water tray or
1 Centrifuge 5702 RH refrigerated and heatable, each without rotor
1 power cable
1 operating manual
1 rotor key
1 set of fuse

1.3 Installing the device

– The device is heavy. Lifting and carrying the device can lead to back injuries.
  ► The device may only be transported in its original packaging.
  ► The device must be transported by least two people.
  ► Use a transport aid (e.g., dolly) to transport the device longer distances.
– **For 5702 R / RH only:** In order to prevent damage to the compressor following improper transport, the device may not be switched on until four hours after setting up.
– **For 5702 only:** Please remove the transport safety device and keep it for possible use if the device is subsequently moved again.
– Place the centrifuge on a solid, flat, non-resonant lab bench. For the Centrifuge 5702 R / RH , the condensation water tray should be inserted from the side (see cover flap).
– The surrounding area must be well ventilated and protected against direct sunlight.
  To ensure that the ventilation of the device is not impaired, a fundamental clearance of 30 cm to the side and a min. of 15 cm to the back wall must be maintained. This is especially important for the refrigeration capacity of the 5702 R / RH.
– During centrifugation, according to the recommendations set out in EN 61010-2-020 a safety clearance of 30 cm must be maintained around the centrifuge within which there are no objects which may be destroyed and so cause further damage.
– Only connect the device to power supplies which correspond with the electrical requirements on the name plate. Only use sockets with a protective earth (PE) conductor and suitable power cable.
– Now connect the centrifuge to the power supply and switch it on at the main power switch (on the rear side, see cover flap). The centrifuge is now ready for operation. The Stand-by button lights up green and the display is active.
– Before starting, check that the rotor is firmly seated.

2 Safety precautions and applicational limitations

⚠ For your personal safety, please be sure to comply with the following regulations unconditionally:

- The centrifuge 5702 / 5702 R / 5702 RH must only be use for the specified applications (see Introduction). It must not be operated in explosive atmospheres. Explosive or highly reactive substances must not be centrifuged.
- When being moved from the cool room to a normal lab environment, the centrifuge must either warm up for half an hour in the cool room first or it must warm up for at least 3 hours in the lab before being connected to the supply system, in order to prevent damage by condensation.
- The centrifuge must not be moved or knocked while in operation.
- Improperly installed or serviced centrifuges must not be operated. Repairs may only be carried out by Service personnel authorized by Eppendorf. Use only original Eppendorf spare parts and rotors.
- When handling toxic, radioactive liquids or pathogenic microorganisms of risk group II (see World Health Organization: Laboratory Biosafety Manual) comply with the relevant national regulations. Bioseals are a part of biological safety systems, which are not able to guarantee the safety of people and the environment on their own when handling pathogenic microorganisms. When working with pathogenic organisms of a higher risk group, more than one aerosol-tight bioseal must be provided for. If the named liquids are spilled in the rotor or rotor chamber, the centrifuge must be thoroughly and professionally cleaned. Before using any cleaning or decontamination method other than that set out in section 4, "Maintenance and cleaning", please consult Eppendorf to ensure the intended method will not damage the device.
- Rotors must always be properly secured. The centrifuge may only be operated with the rotor firmly tightened. For mechanical stability, all the places on the rotor must be fitted with identical buckets.
- The rotor may only be loaded symmetrically. Opposing tubes should be of the same type and be filled equally. On the rotor you will find information concerning the weight that a completely filled bucket may not exceed.
- Prior to centrifugation, the tubes should in any case be visually inspected for material damage. Damaged tubes may not be centrifuged. This is because broken tubes can, in addition to sample loss, result in further damage to the centrifuge and accessories.
- Rotors showing clear signs of corrosion or mechanical damage must not be used. Check the accessories regularly.
- Rotors are high-grade components which have to withstand extreme stresses and strains. Aluminum rotors are largely protected from corrosion by the most common laboratory chemicals by means of an anodized coating, though the protection is not unlimited. Protect the rotors from mechanical damage. Even minor scratches or cracks can result in serious internal material damage. Avoid damaging the rotors by the use of aggressive chemicals, such as: strong and weak alkalis, strong acids, solutions of mercury, copper and other heavy metal ions, chlorinated hydrocarbons, concentrated salt solutions and phenol. If the rotor is contaminated by aggressive substances, clean it **immediately** with a mild cleaning agent.
- The material being centrifuged may not exceed a density of 1.2 g/ml at maximum rotation speed. If the rotor is run for a lengthy period of time, or more often with short centrifugation runs the sample tubes will become hot. Keep within the limits specified by the tube manufacturers.
- Seal the tube lid down tight before centrifuging. The lids of unclosed tubes may rip off during centrifugation and damage the centrifuge.
- When using organic solvents (e.g. phenol, chloroform) the durability of plastic tubes may be impaired.
- When closing the centrifuge lid do not place your fingers between the lid and the centrifuge, otherwise they may be trapped.

2 Safety precautions and applicational limitations

The following rotors and accessory buckets have a maximum service life of 7 years:

A-4-38	5702 720.003 and 5702 740.004
A-8-17	5702 700.002

The date of manufacture is engraved on them in the format 10/01 (October 2001).

Transparent aerosol-tight caps made of polycarbonate have a maximum service life of 3 years.
The date of manufacture is embossed on them in the form of a clock .

Aerosol tight caps may lose their sealing strength when exposed to organic solvents (e.g. phenol, chloroform).
Check the aerosol-tight caps regularly for changes or cracking. Aerosol-tight caps showing cracks or other changes must be replaced immediately.

Rotors, caps or buckets which have been damaged by chemical or mechanical factors or which have passed their maximum service life may no longer be used!

– **Transfer**
  If the device is passed on to someone else, please include the instruction manual.

– **Disposal**
  In case the product is to be disposed of, the relevant legal regulations are to be observed.

– **Information on the disposal of electrical and electronic devices in the European Community**
  The disposal of electrical devices is regulated within the European Community by national regulations based on EU Directive 2002/96/EC on waste electrical and electronic equipment (WEEE).
  According to these regulations, any devices supplied after 13.08.05 in the business-to-business sphere, to which this product is assigned, may no longer be disposed of in municipal or domestic waste. They are marked with the following symbol to indicate this.

  As disposal regulations within the EU may vary from country to country, please contact your supplier if necessary.

– **Declaration concerning the ATEX directive (94/9/EC)**
  The present design and ambient conditions inside Eppendorf centrifuges mean that they are not suitable for use in a potentially explosive atmosphere. The centrifuges must therefore only be used in a safe environment such as the open environment of a ventilated laboratory or a fully-extracted fume hood. The use of substances which may contribute to a potentially explosive atmosphere is not permitted. The final decision on the risks in connection with the use of such substances is the responsibility of the user of the centrifuge.

3 Operation

3.1 Functional and operator control elements

Refer to the frontal view on the first inside cover page of this manual.
Fig. 1: Front view of the Centrifuge 5702.
Fig. 2: Front view of the Centrifuge 5702 R. Front of the Centrifuge 5702 RH is structurally identical to that of the 5702 R

time	–	Time dial and Start/Stop button
short	–	Short run button
speed	–	Speed selector dial and rpm/rcf button
⏻	–	Stand-by button
open	–	Lid release
1	–	Line socket with fuse set and main power switch, device identification plate with power supply ratings (rear).
E	–	Emergency lid release on underside with pull cord

For the Centrifuge 5702 R / 5702 RH only:

temp	–	Temperature selection buttons
fast temp	–	Controlled temperature button
prog 1	–	Program button 1
prog 2	–	Program button 2
C	–	Condensation water tray

3.2 Fitting and removing the rotors

When fitting the rotor, follow the marking triangles on each side of the rotor nut ⊖ ⊖. They indicate the direction of the groove on the underside of the rotor, and are needed to position the rotor safely.

To insert the rotor rotate the driver pin of the motor shift longitudinally.

Fit the rotor onto the motor shaft so the marking triangles point in the same direction as the motor shaft driver pin. Tighten the rotor nut by turning them clockwise using the rotor key supplied. If the rotor nut does not tighten easily, check whether the rotor has caught on the motor shaft driver pin.

To release the rotor turn the rotor nut anticlockwise using the rotor key.

3.3 Loading the rotors

The rotors and buckets (round and rectangular) must be loaded symmetrically. The adapters must be loaded only with the specified tubes. Minimize the difference in weight between the filled sample tubes. This will reduce wear on the drive and cut running noise. The centrifuges 5702 / 5702 R / 5702 RH have an automatic imbalance detector, which shuts down the centrifuge if the weight differences are excessive. This is indicated by the error message "Inb" in the display.

⚠ The maximum weight for a fully loaded bucket is indicated on each rotor.

3 Operation

3.4 Fixed-angle rotor

The fixed-angle rotor **F-35-30-17** can be loaded with 15 ml Falcons® and 15 ml round bottom centrifuge tubes. It is available in the 10 and 30 position versions. Please use only swing-bucket rotor A-4-38 with round buckets and the appropriate adapters for centrifuging blood sampling systems.

Before centrifuging the Falcons®, place their plastic adapters in the tube holders. The adapters prevent the Falcons® from being destroyed. For the centrifugation of round bottom tubes made of Duran® glass, round rubber pads are required to prevent the tubes from cracking. Make sure a rubber pad is placed under each glass tube before centrifuging.

In order to avoid breakage of the tubes when using centrifuge tubes of glass, polystyrene or similar materials, please observe the limiting data with reference to endurance specified by the manufacturer.

The maximum load capacity for Falcons® is 20 x 15 ml; for 15 ml round bottom centrifuge tubes 30 x 15 ml. The rotor can be loaded with a combination of 15 ml Falcons® and 15 ml round bottom centrifuge tubes. The maximum capacity is then 20 x 15 ml Falcons® and 10 x 15 ml round bottom centrifuge tubes.

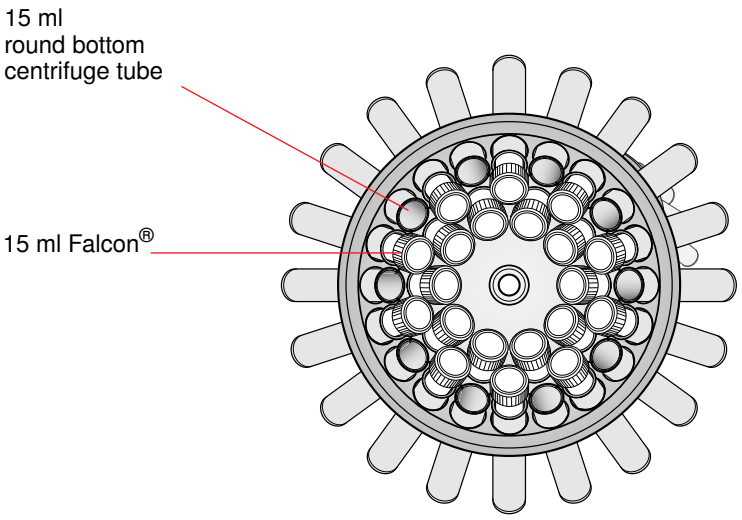


Fig.3: Loading of rotor F-35-30-17 with 15 ml Falcons® and 15 ml round bottom centrifuge tubes

The specified max. weight of 56 g imprinted on the rotor is the gross weight rating including the tube holder, adapter, tubes and contents. Always weigh the tube holder and the load together.

A maximum of 24 1.5/2.0 ml test tubes can be centrifuged in rotor **F-45-24-11**. If the appropriate adapters are used, it is also possible to load it with 0.2 ml PCR tubes, 0.4 ml test tubes, 0.5 ml test tubes and 0.6 ml Microtainers®.

Fixed-angle rotor **F-45-18-17-Cryo** can be equipped with cryotubes (max. diameter 17 mm or 13 mm with adapters) and sealable centrifuge tubes (max. diameter 16.5 mm or 12.2 mm with adapters). In each of these cases, max. tube length is 50 mm.

Maximum load (adapter, tube and contents) per bore is 3.75 g on rotor F-45-24-11 and 8.7 g on rotor F-45-18-17-Cryo. When loading the rotors, please make sure that the tubes are inserted in the bores of the rotor opposite one another in pairs.
To ensure that the rotor is loaded symmetrically, the tubes opposite one another need to contain approximately the same filling quantity.

Fixed-angle rotors are operated without a rotor lid.

3 Operation

3.5 Swing-bucket rotors

The swing-bucket rotor **A-4-38** can be equipped with round or rectangular buckets. Round buckets and the associated adapters (see ordering information) are conceived for the centrifugation of Falcons®, blood withdrawal systems and other centrifuging tubes with round bottoms. Rectangular buckets and associated adapters (see ordering information) are conceived for the centrifugation of glass centrifugation tubes.

⚠ Use only the rotor / bucket (round or rectangular) / adapter combinations approved by Eppendorf. Check that all buckets are fully attached, lubricated lightly and can swing out freely. If you use overlength tubes, it is essential to carry out a manual swing test with empty tubes! When the rectangular buckets are not completely filled, insert the adapters so that the bolts of the rotor A-4-38 are symmetrically loaded. Avoid unbalanced loading of the inner adapter bores, pointing to the rotor nut, since this could cause overshooting of the rectangular buckets.

For mechanical stability, all the places must be fitted with identical buckets. The buckets are sorted by weight. The weight class is embossed on the side of the bucket: e.g. 90 (the last 2 digits in grams). Opposing buckets must be of the same weight class. When reordering, please quote the weight class required.

Before inserting the buckets in the grooves, make sure the grooves are clean. Dirty grooves or pegs will prevent the buckets from swinging out evenly.

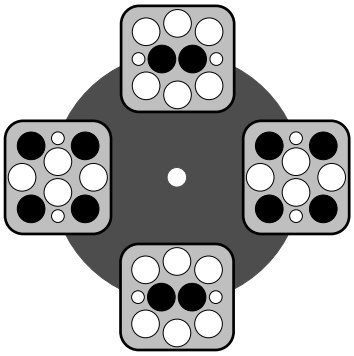


Fig. 4:
Rotor and buckets symmetrically loaded.

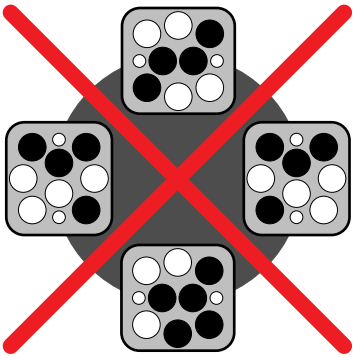


Fig. 5:
Rotor and buckets asymmetrically loaded. Not permitted, because the pegs of the buckets are subject to differing loads.

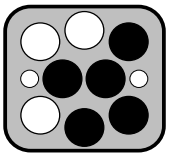


Fig. 6:
Adapter loaded asymmetrically. Not permitted, because the pegs of the bucket are not uniformly loaded and the loading of the adapter bores pointing to the rotor nut could cause overshooting of the rectangular buckets.

The specified max. weight of 400 g imprinted on the rotor is the gross weight rating of a bucket (including adapter, tubes and contents).

The maximum load (adapter, tubes and contents) of the round bucket is 190 g. The maximum load (adapter, tubes and contents) of the rectangular bucket is 240 g.

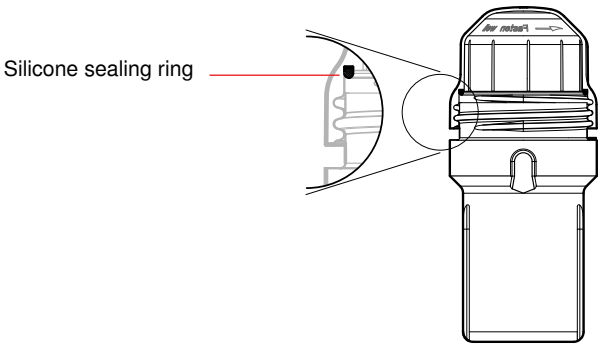
A maximum of 8 x 15 ml Falcons® or 8 x 15 ml tubes of Duran® glass can be centrifuged in the rotor **A-8-17**. Prior to the centrifugation of 15 ml Falcons®, please insert the provided plastic adapter into the rotor. Prior to the centrifugation of tubes of Duran® glass, please insert the round rubber plate into the rotor. Please make certain prior to centrifugation that such a rubber plate is found under every glass tube. In order to avoid breakage of the tubes when using centrifuge tubes of glass, polystyrene or similar materials, please observe the limiting data with reference to endurance specified by the manufacturer.

Only load the rotor symmetrically, so that the rotor and the pivots are evenly loaded during centrifugation. The maximum load (adapter, tubes and contents) of the rotor A-8-17 is 8 x 38 g. The maximum permissible tube length is 120 mm.

3 Operation

3.6 Operation of round bucket with aerosol-tight caps

The inner part of the aerosol-tight cap is also equipped with a silicone sealing ring. Never remove this sealing ring from the cap. Whenever using the cap, make sure that the sealing ring is undamaged and sits uniformly in the groove.



The round bucket and the aerosol-tight cap are autoclavable (121 °C, 20 minutes). The aerosol-tight cap, including the silicone sealing ring, is subject to natural wear and must be replaced when visual inspection reveals wear.

When handling the aerosol-tight cap, remember that polycarbonate has limited chemical resistance to phenol.

3.7 Centrifugation with timer setting

Switch on the centrifuge, with the mains power switch if necessary, and then with the ⏻ switch. The nominal values of the last run are displayed. Load the rotor symmetrically and close down the centrifuge lid.

time	–	Alters the running time.
speed	–	Alters the speed in increments of 100 1/min or rcf.
start	–	Starts the run. The ■ symbol flashes while the rotor is running.
stop	–	Stops the centrifuge. The ▙ symbol appears briefly as soon as the rotor comes to a standstill.
stand-by	–	Centrifuge switched to stand-by mode.
open	–	Releases the lid latch.
temp	–	Changes the nominal temperature value (for 5702 R / 5702 RH only)

While the centrifuge is running the remaining time is displayed. The last minute is counted down in seconds. When the preset time elapses the centrifuge stops automatically and emits a signal tone to indicate the centrifugation is finished.

The lid of the non-refrigerated Centrifuge 5702 opens automatically following centrifugation. The lid of the refrigerated Centrifuge 5702 R / 5702 RH remains closed to maintain the sample temperature and can be opened with the OPEN button.

When you switch off the centrifuge 5702 / 5702 R / 5702 RH at the main power switch the display goes blank after a few seconds' delay.

3.8 Changing the centrifugation parameters during the run

The timer setting, the rotation speed and the temperature (only 5702 R / 5702 RH) can be changed during the run by briefly pressing the SHORT button. The display begins flashing. You can then set the new centrifugation parameters with the TIME and SPEED and the TEMP dial adjustors. The new centrifugation parameters are programmed after 5 seconds.

3.9 Short centrifugation

short	–	Press this button with the lid closed to start a short run at maximum speed. The centrifuge stops when you release the SHORT button again.

3.10 Continuous running

time – The continuous run function is set by turning the TIME dial to either above 99 minutes or below 0.5 minutes. The timer displays "oo" to indicate that continuous running is active. The time is counted upward in minutes.

stop – Ends continuous running

3.11 Rcf display and calculation

SPEED – Press the dial to toggle the display between 1/min (rpm) and (rcf) and vice versa.

Note that the rcf (g-force) indicated when the display is switched is standardized to 15 ml Falcon® tubes in the rotor A-4-38. At 4,400 1/min you can achieve the following maximum rcf with the various adapters.

Rotor	Adapter	Max. centrifuging radius (cm) r_{max}	Max. rcf (g-force), rounded
A-4-38 Round bucket	1.5/2.0 ml	13.4	2,900
	1.1 – 1.4 ml	13.2	2,850
	2 – 7 ml	13.2	2,850
	2.6 – 7 ml	13.2	2,850
	4 – 10 ml	13.2	2,850
	9 – 15 ml	13.0	2,800
	15 ml Falcon®	**13.7**	**3,000**
	25 ml	13.5	2,900
	50 ml Falcon®	13.5	2,900
	85 ml	13.5	2,900
A-4-38 Rectangular bucket	5 – 7 ml	12.7	2,750
	9 ml	12.7	2,750
	15 ml	12.7	2,750
	20 ml	12.7	2,750
	25 ml	12.7	2,750
A-8-17	15 ml Falcon®	12.8	2,770
	15 ml DIN-tube	12.8	2,770
F-35-30-17 Outer ring	15 ml	12.7	2,750
	15 ml Falcon®	12.7	2,750
F-35-30-17 Inner Ring	15 ml	10.7	2,300
	15 ml Falcon®	10.7	2,300
F-45-24-11	0.2 ml	6.6	1,430
	0.4 ml	8.2	1,770
	0.5/0.6 ml	7.4	1,600
	1.5/2.0 ml	8.2	1,770
F-45-18-17-Cryo	without adapter	9.1	1,970
	with adapter	8.9	1,930

To ascertain the maximum rcf for a specific adapter you can apply the following formula as per DIN 58 970:

$rcf = 1{,}118 \cdot 10^{-5} \cdot n^2 \cdot r_{max}$

n: rotational speed in 1/min

r_{max}: max. centrifuging radius in cm

Example: The 85 ml adapter has a maximum radius of 13.5 cm. At 4,000 rpm a maximum rcf of 2,415 x g is reached.

3 Operation

3.12 Adjusting the acceleration and braking ramps

When working with Ficoll® density gradients or other sensitive applications (e.g. certain types of blood and urine centrifugations) slower acceleration and braking ramps can be switched on for the Centrifuge 5702 / 5702 R / 5702 RH. This makes the centrifuge accelerate and decelerate gently. This guarantees optimal centrifugation results.

Press the SHORT key for longer than 5 seconds while the centrifuge lid is open. On the Centrifuge 5702, the text in the display changes from "br on" (brake on) to "br OF" (brake off). The symbol soft appears in the display of Centrifuges 5702 R / RH. The slower acceleration and braking ramps are now activated. The current status will be displayed when the SHORT button is pressed for less than 5 seconds while the centrifuge lid is open.

To switch faster acceleration and braking back on, press the short key for longer than 5 seconds again while the centrifuge lid is open. The "br on" message appearing briefly in the display signals the reactivation of the faster acceleration and braking ramps.

3.13 At set rpm

For centrifugation, time can be counted either immediately from the start or not until attainment of the preset speed.

Pressing the START / STOP button for longer than 2 seconds with the centrifuge lid open switches the "at set rpm" mode, symbolized by the pictogram .

To exit the "at set rpm" mode again and begin counting down the centrifugation time immediately after starting the centrifuge, press the START / STOP button again for longer than 2 seconds with the centrifuge lid open until the pictogram is displayed.

3.14 Activating and deactivating the signal tone

Press and hold down the OPEN button for longer than 2 seconds with the centrifuge lid open to toggle between "b on" (signal tone on) and "b OF" (signal tone off). Press the OPEN button for less than 2 seconds with the centrifuge lid open to display the current status. With the Centrifuge 5702 R / 5702 RH the selected signal tone is symbolized by the pictogram .

The current status is shown when the OPEN button is pressed for less than 2 seconds while the centrifuge lid is open (Centrifuge 5702).

3.15 Parameter lock

To secure the centrifuge parameters against unintentional adjustment, the Centrifuge 5702 and the Centrifuge 5702 R / 5702 RH allows you to lock in the parameters you need.

Press and hold down OPEN- and SHORT-button simultaneously for at least 5 seconds with the centrifuge lid open. After 5 seconds the dial adjuster is disabled and the centrifugation parameters are locked against unintentional adjustment. "Lo on" appears in the display of the Centrifuge 5702. In the display of the Centrifuge 5702 R / 5702 RH the locked parameters are symbolized by an additional pictogram . The preset parameters can then no longer be altered, whether the centrifuge is running or not. The START/STOP button can still be used to start and stop the centrifuge however. It is also still possible to switch the signal tone and rcf switch on and off.

With the Centrifuge 5702 R / 5702 RH it is also possible to additionally lock a program called up against unintentional resetting. A program already written is called up through the program buttons and then – as described above – the program buttons and dial adjustor setting deactivated.

To enable the dial adjuster again, press and hold down OPEN- and SHORT-button simultaneously for 5 seconds with the centrifuge lid open. The display shows "Lo OF" or (5702 R / 5702 RH). The current status ("Lo on") can be displayed on the Centrifuge 5702 by briefly pressing the SHORT and OPEN buttons while the lid is open.

3.16 Programming (for 5702 R / 5702 RH only)

With the Centrifuge 5702 R / 5702 RH it is possible to store up to two permanent programs (only during standstill):

First set the required program data with the TIME and SPEED dial adjustors. The function "at set rpm" and the switched-off braking function can also be stored if necessary in the permanent program.

PROG 1 or 2 – Hold down for 2 seconds until the program button is no longer flashing and lights up continuously. A brief signal will sound. The program is now stored.

3.17 Program selection (for 5702 R only)

Program selection is only possible during stillstand.

PROG 1 or 2 – Pressing once calls up the required program. The button for the program activated lights up in blue.

If dial adjustors or buttons are required for the program setting, the program remains unchanged.
The text "Pr 1" (Program 1) or "Pr 2" (Program 2) appears in the centrifuge display.

Exit the program by again pressing the program button. The blue lighting of the button extinguishes and the centrifugation parameters can be set freely again.

3.18 Refrigeration (for 5702 R only)

temp – The nominal temperature value can be set with the arrow keys from – 9 °C to + 40 °C. During stillstand, the nominal temperature setting and the current temperature in the rotor chamber are displayed alternately. With the centrifuge running, only the current temperature in the rotor chamber is displayed.

A deviation of more than ± 3 °C from the temperature set is signalled during the run.

fast temp – starts a controlled temperature run with a centrifuge-specific rotation speed, in order to quickly reach the selected temperature in the rotor. During the FAST TEMP run, "FA" appears in the display, as well as the present temperature and the fixed optimal rotational speed. The run ends automatically or by pressing the STOP button. A signal tone sounds periodically.

Stand-by refrigeration – With closed centrifuge lid the rotor chamber is refrigerated before and after a run to the selected nominal temperature if this is less than the ambient temperature. Since there is no rotation of the rotor, the temperature adaptation takes place slowly. If the centrifuge was in standby refrigeration over a longer time or at low temperatures, start a brief FAST TEMP run before inserting the samples in order to prevent the samples from freezing.

If the centrifuge is not used for more than 8 hours or the lid is not opened, the refrigeration switches off to protect the device.

Remark: In cases of higher ambient temperature, temporary air noises may occur until the desired temperature is attained. These are a sign of high refrigeration capacity. Block the ventilation slots under no circumstances!

For ambient temperatures below 18 °C a warming-up time of 1 hour is required before operating.

3 Operation

3.19 Heating and refrigeration (5702 RH)

In the case of the Centrifuge 5702 RH, we are dealing with a benchtop centrifuge with a regulated heating and cooling system. The Centrifuge 5702 RH can be refrigerated or heated precisely within a temperature range from – 9 °C to + 42 °C. By way of preprogrammed temperature profiles, it is possible to set optimized temperature arcs for the available swing-bucket and fixed angle rotors. This enables exact temperature control even for sensitive samples.

Setting the preprogrammed temperature profiles:
Pressing the Fast Temp key while the centrifuge lid is open results in the display of the set rotor with the corresponding temperature profile. Using the arrow keys it is possible to select other temperature profiles. The displays appearing stand respectively for the following rotors:

Display	Rotor
ro F 35	Fixed-angle rotor F-35-30-17
ro F 24	Fixed-angle rotor F-45-24-11
ro F 18	Fixed-angle rotor F-45-18-17-Cryo
ro A4 rE	Swing-bucket rotor A-4-38 with rectangular buckets
ro A4 ro	Swing-bucket rotor A-4-38 with round buckets
ro A8	Swing-bucket rotor A-8-17
ro AL L	General temperature profile for all rotors

After 5 seconds a selected temperature profile will be automatically adopted and the display will return to the operating status.

temp – The temperature nominal value can be set using the arrow keys. During the rest period of the centrifuge, the current temperature and the temperature nominal value are displayed alternately (current temperature short, temperature nominal value long). Only the current temperature is displayed during the run. A deviation of the set temperature nominal value of more than ± 3 °C is signalled during the run by a blinking temperature display

fast temp – Starts a temperature control run in order to reach the preselected temperature as quickly as possible. During the temperature control run, "FA" appears in the display, as well as the current temperature and the optimum rotational speed. Refrigeration runs at less than room temperature are automatically carried out with a rotor-specific, low rotational speed, while heating runs are carried out initially with a maximum and then with a nominal rotational speed. For runs with precisely controlled temperatures, we recommend starting a short Fast Temp run immediately prior to centrifugation. This prevents an overshooting of the temperature in the rotor chamber, such as can sometimes occur after longer standby periods.

Stand-by Heating and refrigeration – The rotor chamber is heated or cooled to the selected nominal temperature both before and after a run with the lid closed. Because the rotor does not thereby rotate, the temperature adjustment occurs slowly. The current temperature in the rotor chamber is displayed. For runs with precise temperature control following longer standby periods, we recommend starting a brief Fast Temp run immediately prior to centrifugation. This prevents potential overshooting of the temperature in the rotor chamber.

3.20 Opening the centrifuge in case of power failure

Pull the power plug and wait for the rotor to come to a stop (this may take as long as 5 minutes!). Emergency lid release on underside of device by pull cord: In front of the front right suction foot there is a small white plastic cap in the base plate (see "E" in figures 1 and 2, cover flap). Remove the cap and draw the cord out straight downward.

Please be sure to later make certain that the cord is pushed back completely into the housing before closing the lid. Press the plastic button into the baseplate again.

3.21 Device fuses

The fuse box is located under the main power plug. The fuse box can be removed from the rear. The two fuses can be replaced (see Ordering information).

4 Maintenance and cleaning

4.1 Device

The outer surfaces of the centrifuge and the rotor chamber should be cleaned regularly with a mild cleaning agent. This is for hygiene purposes and to prevent adhering impurities causing corrosion.

If material hazardous to health or aggressive material contaminate the device, the owner is responsible for appropriate cleaning and decontamination.
Before cleaning, unplug the power plug with the lid open, unscrew the rotor using the rotor key supplied and clean it separately. Use a mild cleaning agent for cleaning the accessible surfaces of the device. Choose disinfection methods that correspond to the current legal regulations and guidelines for your area of application. Use, for example, alcohol (ethanol, isopropanol) or alcohol-based disinfectants.
Do not allow any liquid to get into the gap at the motor shaft outlet. For this reason, the rotor chamber should be cleaned only with a damp cloth.

You should also consult your laboratory safety officer with regard to a suitable method of cleaning and disinfecting. Before any cleaning or disinfecting method other than that recommended by the manufacturer is used, please check with Eppendorf that the intended method will not damage the device or its accessories. In order to ensure long-term, reliable work with your centrifuge, please note that aggressive chemicals may damage the rotor and the chamber. Check your device once a month for corrosion and damage.

The rubber seals in the rotor chamber should be rinsed off thoroughly with water and lubricated with glycerin or talc after every clean to prevent them becoming brittle.

4.2 Rotors

The rotors, buckets, tube holders and adapters should be cleaned once a month or when necessary with a neutral cleaning agent to prevent residues of the material being centrifuged from changing the properties of the centrifuge and its accessories. The rotor must be taken off for this.

Never place components in disinfectants or cleaning agents which contain sodium hypochlorite/chlorine or are oxidants. This will cause the material to change. Disinfection with glutaraldehyde solution is possible. We recommend Cidex® activated glutaraldehyde solution. The plastic adapters and rubber plates are dishwasher safe.

Check the tube holders and buckets for residues and corrosion. For thorough cleaning, remove the rubber plates from tube holders and buckets and clean all parts separately.

Then refit the rotor and bolt it into place with the supplied rotor key. Check the rotor, tube holders and buckets once a month for mechanical damage.

All rotors, buckets, adapters, caps and tube holders can be autoclaved (121 °C, 20 min).

The aerosol-tight cap, including silicon sealing ring, rubber mats and rectangular bucket adapters are subject to normal wear and must be replaced when a visual inspection reveals wear.

Do not unbolt the rectangular bucket adapters from each other.

On the swing-bucket rotor make sure, in particular, that the pegs and grooves of the buckets are free of dirt. They should be lightly lubricated with pivot grease (provided with each swing-bucket rotor) so the buckets can swing freely.

The aerosol-tight buckets must not be stored with their caps sealed!

4.3 Refrigerated centrifuges

Clean condensation water and ice buildup regularly from the rotor chamber (by defrosting), using a soft, absorbent towel.

Regularly empty and clean the condensation water collector. Remove this from the left. Please clean the condensation water drain regularly.

4 Maintenance and cleaning

4.4 Glass breakage

When centrifuging glass tubes, please observe that high speeds/rcf's increase the risk of glass breakage. Please follow the manufacturer's instructions concerning the maximum speed/rcf of centrifuge tubes. In the event of glass breakage, carefully remove all splinters and all ground glass from the rotor, the buckets, the adapters and the rotor chamber. You may need to replace the rubber mats and adapters to prevent further damage.

Fine splinters of glass may otherwise scratch the surface of the rotors and buckets, reducing their resistance to chemicals. The air turbulences within the rotor chamber produce a very fine black powder of abraded metal. In addition to causing damage to the rotor chamber, rotor, buckets and adapters, the powder also contaminates the samples.

Check the rotor bores regularly for residues and damage.

4.5 Returning devices

When returning centrifuges, please ensure that these devices are fully decontaminated so that they do not present a health risk to our service staff.

You will find additional information and a blank of the decontamination confirmation at www.eppendorf.com.
Do also consult your laboratory safety officer about a suitable decontamination method.

Please fill out the decontamination confirmation and place it together with the device when it is to be sent back to Eppendorf.

5 Troubleshooting

Error		Cause	Remedy
Stand-by button lit red.		Centrifuge not ready.	Press STANDBY button.
No display.		No power.	Plug power cable in on both ends.
		Power failure.	Check power fusing of lab / device.
Lid will not open.		Power failure.	Emergency lid release (see section 3.20).
		Rotor still running.	Wait for rotor to stop.
Centrifuge shakes when starting up.		Rotor unevenly loaded.	Stop centrifuge and load evenly.
Centrifuge will not start.		Lid not closed.	Press lid down or press OPEN button.
Display:	**LID**	Lid not released.	Press lid down tight, press Start/Stop or emergency lid release.
		Lid not locked.	Close lid again.
	Lo on (only 5702)	Centrifugation parameters locked against adjustment.	With open centrifuge lid simultaneously press SHORT and OPEN for 5 seconds (see 3.15) if parameters should be readjusted.
	P 1 **P 2**	Program 1 or 2 is called up.	Press illuminated program button to exit the program level (if required).
	FA	Display indicates a FAST TEMP run.	The run can be interrupted with the START / STOP button if required.
	Inb	Rotor unevenly loaded.	Check loading and repeat run.
	Int	Power failure during run.	Check power plug. Wait for rotor to come to a stop. Repeat run.
	Er 2	Unbalanced rotor switch defective.	Inform Service.
	Er 3	Error in speed system.	Leave device switched on until error message disappears (up to 5 min).
	Er 5	Lid switch.	Close lid, restart.
	Er 6	Drive error.	Repeat run.
	Er 7	Overspeed.	Error in drive or speed measurement system.
	Er 8	Drive error.	Repeat run.
	Er 9 – 25	Electronics error.	Repeat run.
	Er 18	Temperature deviation > 5 °C fr. nominal value.	Nominal value setting too low or refrigeration defective.
	Er 19	Refrigeration unit overheated.	Make sure that the air circulation through the cooling slots is not impaired.
	Er 23 (only 5702)	Motor overheating.	Allow motor to cool.
	Er 24	Fault in the refrigeration unit.	At start of operation: contact Service. After longer running time: allow centrifuge to cool down.

If the suggested remedy repeatedly fails, please contact Service.

6 Technical data

	Centrifuge 5702	**Centrifuge 5702 R / 5702 RH**
Line connection:	230 V / 50 – 60 Hz 120 V / 50 – 60 Hz 100 V / 50 – 60 Hz	230 V / 50 – 60 Hz 120 V / 50 – 60 Hz 100 V / 50 – 60 Hz
Power output:	200 W	380 W
Max. speed:	4 400 rpm	4 400 rpm
Max. centrifugal acceleration:	3 000 rcf	3 000 rcf
Max. load:	4 x 90 ml	4 x 90 ml
Max. kinetic energy:	2 280 Nm	2 280 Nm
Permissible density of material being centrifuged:	1,2 g/ml	1,2 g/ml
Ambient temperature:	2 – 40 °C	10 – 40 °C
Max. rel. air humidity:	75 %	75 %
Positioning height:	max. 2000 m above NSL	max. 2000 m above NSL
Dimensions:	Height: 241 mm Depth: 395 mm Width: 320 mm	Height: 265 mm Depth: 580 mm Width: 380 mm
Weight excluding rotor:	20 kg	36 kg
Startup time (230 V):	< 25 sec	< 25 sec
Deceleration time:	< 25 sec	< app. 25 sec
Startup time (100 V / 120 V):	< 25 sec	< 25 sec
Deceleration time:	< 25 sec	< app. 25 sec
Fuses:	2.5 A time-lag 230 V 5.0 A time-lag 120 V / 100 V	2.5 A time-lag 230 V 5.0 A time-lag 120 V 6.0 A time-lag 100 V
Noise level:	< 58 dB (A)	< 54 dB (A), steady state at 4ºC; 23ºC ambient temperature, empty rotor
Overvoltage category:	II	II
Degree of contamination:	2	2

Technical specifications subject to change!

7 Ordering information

Centrifuge 5702	
230 V / 50 – 60 Hz, without rotor	5702 000.019
Centrifuge 5702 R	
230 V / 50 – 60 Hz, without rotor	5703 000.012
Centrifuge 5702 RH	
230 V / 50 – 60 Hz, without rotor	5704 000.016
Fixed-angle rotor and accessories	
Fixed-angle rotor F-35-30-17 Aluminum, 30 places, angle 35°, for mounting of 15 ml Falcons® or 15 ml round bottom centrifuge tubes, complete with stainless steel tube holders for	
30 places	5702 704.008
10 places	5702 705.004
Tube holders (stainless steel), for rotor F-35-30-17, for mounting of 15 ml Falcons® or 15 ml round bottom centrifuge tubes, set of 10	5702 707.007
Adapter, conical, to support 15 ml Falcons®, for rotor F-35-30-17, set of 10	5702 706.000
Rubber mat for 15 ml round bottom centrifuge tubes, set of 10	5702 708.003
Fixed-angle rotor F-45-24-11 Aluminum, angle 45°, 24 places, max. ∅ 11 mm for mounting of 1.5/2.0 ml micro test tubes	5702 746.002
Adapter for 0.2 ml PCR tubes, for rotor F-45-24-11, set of 6	5425 715.005
Adapter for 0.4 ml micro test tubes, for rotor F-45-24-11, set of 6	5425 717.008
Adapter for 0,5 ml micro test tubes and 0.6 ml Microtainer®, for rotor F-45-24-11, set of 6	5425 716.001
Fixed-angle rotor F-45-18-17-Cryo Aluminum, angle 45°, 18 places, max. ∅ 17 mm for mounting of cryotubes (max. ∅ 17 mm) and centrifuge tubes which can be sealed (max. ∅ 16.5 mm), max. length in mm: 50	5702 747.009
Adapter for cryotubes (max. ∅ 13 mm) and centrifuge tubes which can be sealed (max. ∅ 12.2 mm), max. length in mm: 50	5702 752.002
Swing-bucket rotors and accessories	
Swing-bucket rotor 4 x 85 ml, type A-4-38, aluminum, incl. 4 round buckets	5702 720.003
Swing-bucket rotor 4 x 85 ml, type A-4-38, aluminum, excluding round buckets	5702 740.004
Round bucket 85 ml for A-4-38, set of 4	5702 722.006
Round bucket 85 ml for A-4-38, set of 2	5702 761.001
Caps, aerosol tight, for round bucket 85 ml, set of 2	5702 721.000

7 Ordering information

Adapter for standard tubes and blood sampling systems for round bucket 85 ml

2 adapters 4 x 1.5 – 2.0 ml micro test tubes		5702 745.006
2 adapters 5 x 1.1 – 1.4 ml (ø adapter bore x max. vessel length in mm: 8.5 x 100)		5702 736.007
2 adapters 5 x 2 – 7 ml	(12.5 x 100)	5702 737.003
2 adapters 4 x 2.6 – 7 ml	(13.5 x 100)	5702 719.005
4 adapters 4 x 4 – 10 ml	(16 x 100)	5702 735.000
9 adapters 4 x 9 – 15 ml	(17.5 x 100)	5702 724.009
2 adapters 1 x 15 ml Falcon®	(17.2 x 121)	5702 732.001
2 adapters 2 x 15 ml Falcon® *	(17.2 x 121)	5702 723.002
2 adapters 1 x 25 ml	(25 x 100)	5702 717.002
2 adapters 1 x 50 ml Falcon®	(30 x 115)	5702 734.004
2 adapters 1 x 85 ml	(38 x 106)	5702 718.009
Rectangular bucket 90 ml for A-4-38, set of 4		5702 709.000
Rectangular bucket 90 ml for A-4-38, set of 2		5702 762.008

* Do not use with aerosol tight caps.

Adapter for standard tubes for rectangular buckets

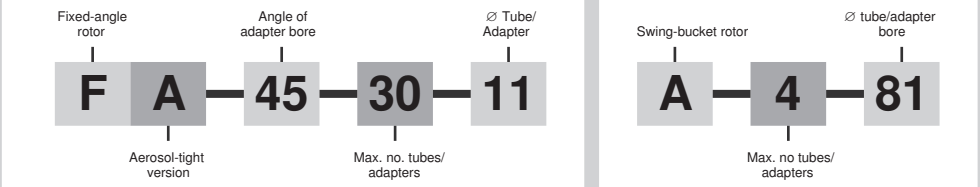
2 adapters 10 x 5 – 7 ml	5702 710.008
2 adapters 8 x 9 ml	5702 711.004
2 adapters 6 x 15 ml	5702 712.000
2 adapters 4 x 20 ml	5702 713.007
2 adapters 2 x 25 ml	5702 716.006
Swing-bucket rotor type A-8-17	5702 700.002
Adapter, conical, to support 15 ml Falcons®, for rotor A-8-17, set of 8	5702 702.005
Rubber pad for 15 ml round bottom centrifuge tubes, set of 8	5702 701.009
Set of fuses	
for 5702 / 5702 R 230 V (2 x 2.5 A time-lag)	5425 351.003
for 5702 / 5702 R 120 V (2 x 5 A time-lag)	5425 353.006

Important note:
Please use the original accessories recommended by Eppendorf. Using spare parts or disposables which we have not recommended can reduce the precision, accuracy and life of the centrifuges. We do not honor any warranty or accept any responsibility for damage resulting from such action.

Falcon®: Registered trademark of Becton Dickinson
Cidex®: Registered trademark of Johnson & Johnson
Duran®: Registered trademark of Schott
Ficoll®: Registered trademark of Pharmacia Biotech AB
Microtainer®: Registered trademark of Becton Dickinson

Rotor code

All Eppendorf rotors are designated according to a simple, logical system which describes the technical specifications as a uniform series of numbers and letters e.g.:



Mode d’emploi succinct

La centrifugeuse 5702 est une centrifugeuse de table non refroidie, la centrifugeuse 5702 R une centrifugeuse de table refroidie et le centrifugeuse 5702 RH une centrifugeuse de table refroidie et chauffante.

Avant la première mise en service de la centrifugeuse 5702 / 5702 R / 5702 RH, il convient de lire attentivement le mode d’emploi. La version la plus récente du mode d'emploi et des consignes de sécurité dans votre langue se trouvent sur Internet à l'adresse www.eppendorf.com. Pour un aperçu complet du mode d'emploi, nous vous recommandons de lire en outre la version en anglais (pages 24 à 40) ou en allemand (pages 5 à 23), plus complètes.

Vous trouverez ce symbole sur votre centrifugeuse, ainsi qu'à différents endroits de la notice d'utilisation. Celui-ci indique la présence de consignes de sécurité importantes. N'utiliser la centrifugeuse qu'après avoir lu ces consignes de sécurité.

Utilisation correcte

La Centrifuge 5702 / 5702 R / 5702 RH est destinée uniquement à être utilisée à l'intérieur et a été conçue pour séparer des fluides et des éléments en suspension de densités différentes dans des microtubes agréés.

Cet appareil doit être uniquement utilisé par le personnel de laboratoire ayant reçu la formation nécessaire. L'utilisateur doit avoir pris soigneusement connaissance du manuel d'utilisation et s'être familiarisé avec le fonctionnement de l'appareil.

Installation de l'appareil

– L'appareil est lourd. Soulever et porter l'appareil peut entraîner des problèmes de dos.
  ► Transportez l'appareil uniquement dans son emballage d'origine.
  ► Transportez l'appareil à l'aide d'une deuxième personne.
  ► Pour les longues distances, prévoyez un équipement de transport (par ex. lève-charges).
– Placer la centrifugeuse sur une table de laboratoire stable, horizontale et exempte de résonance. S'assurer d'une bonne ventilation de l'environnement de la centrifugeuse et évider toute incidence solaire directe. Afin d'assurer une bonne ventilation de l'appareil, il est nécessaire de respecter un écart de 15 cm entre l'appareil et les appareils voisins ainsi qu'à l'arrière de l'appareil. Ceci est absolument nécessaire pour la puissance frigorifique de la 5702 R / 5702 RH. La centrifugeuse doit être préchauffée 3 heures dans le laboratoire avant de la raccorder pour la première fois au secteur. Cela évite de l'endommager.
– Enlever les sécurités de transport.
– Au cours de la centrifugation, respecter une espace libre de sécurité de 30 cm autour de la centrifugeuse.
– Ne brancher l'appareil qu’à des sources de tension correspondant aux indications de la plaque signalétique Utiliser exclusivement des prises munies d'un conducteur de protection et d'un câble secteur adéquat
–Avant la première mise en marche, vérifier si le rotor est bien serré.

Consignes de sécurité et limites d'utilisation

Pour votre propre sécurité, il convient de respecter les dispositions suivantes:

– La centrifugeuse 5702 / 5702 R / 5702 RH sera exclusivement utilisée pour les applications indiquées. Elle ne peut pas être mise en service en atmosphère explosive. La centrifugation de substances explosives ou susceptibles de produire des réactions violentes n'est pas autorisée.
– En cas de passage à une chambre froide à une salle de laboratoire ordinaire, la centrifugeuse doit être échauffée une demi-heure dans la chambre froide ou se réchauffer pendant au moins 3 heures dans la salle du laboratoire et ne peut pas être raccordée au réseau afin d'éviter tout dommage dû à la condensation.
– La centrifugeuse ne peut pas être déplacée ou heurtée pendant son fonctionnement.
– Une centrifugeuse qui n'a pas été installée correctement ou réparée par un personnel compétent ne peut pas être utilisée. Les réparations devront être confiées à un atelier après-vente dûment accrédité par la société Eppendorf. Seule l'utilisation de pièces de rechange et des rotors d'origine Eppendorf est autorisée.
– En cas de manipulation de liquides toxiques ou radioactifs ou de germes pathogènes de la catégorie de risques II (v. Organisation Mondiale de la Santé: Laboratory Biosafety Manual), les dispositions légales nationales doivent être respectées. En cas de germes pathogènes avec un groupe de risques plus élevés, il est nécessaire de prévoir une mesure plus importante qu'un scellement bio étanche aux aérosols. Si un liquide des types indiqués est répandu par mégarde dans le rotor ou dans le bol du rotor, la centrifugeuse doit faire l'objet d'un nettoyage soigné par un personnel compétent.
– Les rotors doivent être toujours fixés en tenant compte des prescriptions. La centrifugation ne peut être effectuée que si le rotor est correctement serré. Le rotor doit être chargé de manière symétrique, les tubes diamétralement opposés doivent être du même type et remplis de façon similaire.

Mode d’emploi succinct

– Avant d’effectuer la centrifugation, il convient de vérifier visuellement dans chaque cas un éventuel endommagement des récipients. Les récipients endommagés ne doivent pas être centrifugés puisque si ceux-ci se cassent, il peut y avoir outre la perte de l’échantillon d’autres dommages sur la centrifugeuse et les accessoires.
– Les rotors qui présentent des traces de corrosion évidentes ou des endommagements mécaniques ne peuvent pas être utilisés. Contrôler les accessoires chaque mois. Eviter tout affaiblissement de la protection du rotor par des substances chimiques agressives, telles que des alcalis forts ou faibles, des acides forts, des solutions contenant du mercure, du cuivre ou d'autres ions de métaux lourds, des hydrocarbures chlorés, des solutions salines concentrés ou du phénol. En cas de contamination par des substances agressives, nettoyez le rotor immédiatement avec un détergent doux.
– La densité de la matière à centrifuger ne peut pas dépasser 1,2 g/ml à la vitesse de rotation maximale. Dans le cas d'une durée de fonctionnement plus longue, les tubes à essai vont se réchauffer.
– Verrouiller le couvercle des tubes avant de procéder à la centrifugation. Les couvercles ouverts peuvent s'arracher lors de la centrifugation et endommager la centrifugeuse. Les valeurs seuils spécifiées par le fabricant de tubes concernant la capacité de charge admissible des tubes en plastique doivent être respectées. En cas d'utilisation de solvants organiques (par ex. phénol, chloroforme), la stabilité et la capacité de charge admissible des tubes en plastique peuvent être réduites.
– Lors de la fermeture du couvercle de la centrifugeuse, ne pas poser les doigts en dessous du couvercle au risque de les coincer.

Les rotors suivants et les nacelles correspondantes ont une durée de vie maximale de 7 ans. La date de fabrication est gravée sous le format 10/01, ce qui signifie octobre 2001 :

A-4-38	5702 720.003
A-8-17	5702 700.002

Les couvercles hermétiques transparents ont une durée de vie maximale de 3 ans. La date de fabrication est gravée sous la forme d'une horloge .

Les couvercles étanches aux aérosols peuvent perdre de leur solidité sous l'effet de solvants organiques (par ex. phénol, chloroforme). Contrôler régulièrement si les couvercles hermétiques ne présentent pas de traces de corrosion chimique ou de petites fissures. Les couvercles hermétiques présentant des fissures ou d'autres traces de corrosion doivent être immédiatement remplacés.

Les rotors, couvercles ou nacelles qui sont endommagés sous l'effet de réactions chimiques ou mécaniques ou qui ont dépassé leur durée de vie maximale ne peuvent plus être utilisés !

– **Remise du produit à un tiers**
Si vous mettez ce produit à disposition d’un tiers, veillez à y joindre le présent mode d’emploi.

– **Elimination du produit**
Il convient de se conformer aux réglementations légales applicables pour l’élimination du produit.

– **Informations concernant la mise au rebut des appareils électriques et électroniques dans l'Union européenne**
Au sein de l'Union européenne, les appareils électriques sont régis par des réglementations nationales, basées sur la directive européenne 2002/96/CE relative aux déchets d'équipements électriques et électroniques (DEEE).
En vertu de cette directive, tout appareil livré après le 13.08.2005 dans le secteur Business-to-Business, dont ce produit fait partie, ne pourra plus être mis au rebut avec les ordures ménagères ou par les services municipaux. Pour faciliter leur identification, ces appareils seront pourvus du symbole suivant:

Etant donné que les réglementations relatives à l'élimination des déchets au sein de l'UE peuvent varier d'un pays à l'autre, nous vous invitons à contacter vos fournisseurs au besoin.

Mode d'emploi

Mettre la centrifugeuse sous tension à l'aide du commutateur principal et actionner la touche Standby. Les valeurs de consigne de la dernière centrifugation sont affichées. Pour le montage du rotor, respecter le triangle d'indication fixé des deux côtés des écrous du rotor (fig. triangle). Ils indiquent la direction de la rainure sur la face inférieure du rotor et sont nécessaires à un bon positionnement du rotor. Pour insérer le rotor, tourner le tenon d'entraînement de l'arbre du moteur dans le sens de la longueur. Placer le rotor sur l'arbre du moteur de manière à ce que les triangles d'indication indiquent la même direction que le tenon d'entraînement de l'arbre du moteur.

Serrer à fond les écrous du rotor à l'aide de la clé fournie du rotor en tournant dans le sens des aiguilles d'une montre. Si le serrage des écrous pose problème, vérifier que le rotor s'est bien enfoncé sur le tenon d'entraînement de l'arbre du moteur.Charger le rotor de façon symétrique et fermer le couvercle de la centrifugeuse. Eviter une charge non équilibrée du rotor. Après la centrifugation, le couvercle de la centrifugeuse 5702 s'ouvre automatiquement, le couvercle de la

centrifugeuse réfrigérée 5702 R et 5702 RH reste fermé pour maintenir la température de l'échantillon et peut être ouvert via la touche OPEN.

time	–	Permet de modifier la durée de fonctionnement. Le positionnement du bouton tournant TIME au-delà de 99 min. ou en deçà de 0,5 min. génère la fonction de marche en continu. La marche en continu est indiquée par le message "oo" sur l'affichage du temps.
speed	–	Permet de modifier la vitesse par incréments de 100 1/min ou en accélération x g. La commutation entre les incréments de 100 1/min et l'accélération x g s'effectue en appuyant sur la touche SPEED.
start	–	Permet le démarrage de la centrifugation. Le symbole ■ clignote et indique que le rotor tourne.
stop	–	Arrête la centrifugation. Le symbole apparaît dès que le rotor s'arrête et que le couvercle de la centrifugation peut être ouvert.
stand-by ⏻	–	Permet de mettre en marche et d'arrêter la centrifugation.
open	–	Permet de déverrouiller le couvercle.
temp	–	modifie la valeur théorique de la température (uniquement pour la 5702 R / 5702 RH). La valeur théorique de la température peut être réglée au moyen des touches fléchées de – 9 °C à + 40 °C (– 9 °C à + 42 ° C pour la centrifuge 5702 RH). Au cours de l'arrêt, l'écran indique alternativement la valeur théorique réglée de la température et la température actuelle dans la chaudière du rotor. Au cours de la centrifugation, la température actuelle dans la chaudière du rotor est la seule à être indiquée.
fast temp	_	démarre une temporisation avec un régime spécifique à la centrifugation, un message d'écran "FA" La temporisation se termine automatiquement ou en appuyant sur la touche STOP. Un signal sonore périodique retentit.

Le temps, la température et la vitesse de rotation peuvent être modifiés en cours de centrifugation. Pour ce faire, actionner au préalable la touche SHORT, ce qui entraîne le clignotement de l'affichage de centrifugeuse. Après modification des paramètres de centrifugation, la nouvelle valeur de consigne pour la vitesse de rotation est appliquée.

Le temps de fonctionnement restant est affiché durant la centrifugation. En cas de modification du temps en cours de centrifugation, le temps déjà écoulé est pris en compte. La dernière minute est décomptée en secondes. Lorsque le temps réglé s'est écoulé, la centrifugeuse s'arrête automatiquement.

short	–	Le fait d'appuyer sur cette touche lorsque le couvercle est fermé entraîne une centrifugation brève à régime maximal. La centrifugation est arrêtée en relâchant la touche SHORT.

Programmation
Dans la centrifugeuse 5702 R / 5702 RH, il est possible d'enregistrer jusqu'à deux programmes fixes (uniquement possible à l'arrêt). Régler pour cela les paramètres souhaités. Maintenir appuyées PROG 1 ou 2 jusqu'à ce que la touche de programmation ne clignote plus et soit allumée en permanence. Le programme est enregistré. Un appui bref sur la touche de programmation entraîne l'appel du programme souhaité.

Arrêt de la fonction de freinage
Pour un arrêt progressif sans freinage, appuyer sur la touche SHORT pendant plus de 5 secondes, le couvercle de la centrifugeuse étant ouvert. L'inscription à l'écran passe de "br on" (frein activé) à "br OF" (frein inactivé) ou soft s'affiche (5702 R, 5702 RH), le frein de la centrifugeuse est maintenant inactivé.

Réglage fixe des paramètres
Contre un dérèglement involontaire: le couvercle de la centrifugeuse étant ouvert, appuyer simultanément sur les touches SHORT et OPEN pendant 5 secondes. De cette manière, les paramètres ou les programmes définis de manière fixe ne peuvent plus être déréglés – aussi bien lors de la centrifugation qu'à l'arrêt ; une centrifugation peut quand même être démarrée ou arrêtée via les touches START/STOP.

Mode d’emploi succinct

Ouverture de la centrifugeuse en cas de coupure de courant

Débrancher la fiche secteur et attendre l'arrêt complet du rotor (cela peut prendre 5 min !). Actionner le déverrouillage d'urgence situé sur le côté inférieur de l'appareil en tirant sur le cordon: Devant le pied à ventouse avant droit se trouve dans la plaque de fond un petit bouton en plastique blanc (voir "E" sur la figure), retirer ce bouton et tirer le cordon perpendiculairement vers le bas. Noter que le cordon se rentre ensuite entièrement dans le châssis. Après l'ouverture du couvercle, enfoncer à nouveau le bouton en plastique dans la plaque de fond.

Maintenance et nettoyage

Appareil

Les surfaces extérieures de la centrifugeuse et de la chambre du rotor doivent être régulièrement nettoyées avec un détergent. Il s’agit de mesures d’hygiène et cela empêche la corrosion due aux contaminations.

En cas de contaminations dues aux produits chimiques ou solutions agressives, l’utilisateur est responsable d’effectuer un nettoyage et une décontamination adaptés.
Débranchez la fiche secteur avec le couvercle ouvert, dévissez le rotor avec la clé fournie et nettoyez les éléments séparément. Nettoyez les surfaces accessibles de l’appareil avec un détergent doux. Choisissez une méthode de désinfection conforme aux directives et aux
prescriptions en vigueur pour le domaine d'application. Utilisez par ex. de l’alcool (éthanol, isopropanol) ou d’autres produits désinfectants à base d’alcool. Il faut éviter le liquide de pénétrer dans la fente à la sortie de l’arbre du moteur. C’est pourquoi la chambre du rotor doit être uniquement nettoyée avec un chiffon humide.

Demandez également au responsable de la sécurité du laboratoire de vous indiquer les méthodes de nettoyage ou de désinfections appropriées. Avant d’appliquer une méthode de nettoyage ou de désinfection autre que celle recommandée par le fabricant, veuillez vous assurer auprès de la société Eppendorf que cette méthode ne risque d’endommager ni l’appareil ni les accessoires. Afin de garantir un fonctionnement durable et fiable de la centrifugeuse, veuillez noter que les produits chimiques agressifs peuvent endommager le rotor et la cuve. Contrôlez votre appareil contre les traces de corrosion et d’endommagement une fois par mois.

Les joints en caoutchouc de la chambre du rotor doivent être bien rincés à l’eau après chaque nettoyage, puis enduits de glycérine ou de talc pour empêcher que les joints ne deviennent cassants.

Rotors

L'intérieur du bol du rotor, les béchers hermétiques et les nacelles doivent être nettoyés chaque mois à l'aide d'un produit nettoyant neutre. Vérifier si les orifices du rotor ne présentent pas de traces de corrosion ou de résidus. L'ensemble des rotors, des béchers hermétiques, des adaptateurs et des nacelles sont conçus pour résister à l'autoclave (121 °C pendant 20 min). Les capuchons étanches aux aérosols, y compris le joint en silicone, sont soumis à l'usure naturelle et doivent être remplacés en cas de dégradation perceptible.

Une attention particulière devra être accordée aux rotors libres en veillant à la stricte propreté des pivots et des rainures recevant les béchers hermétiques et les nacelles. Ils devront être lubrifiés à l'aide de la graisse fournie de sorte que les béchers puissent osciller librement.

Les béchers hermétiques ne doivent pas être stockés avec des capuchons serrés!

Verre cassé

Lors de la centrifugation de tubes en verre, il faut savoir que le risque de bris de verre s'accroît au fur et à mesure que la vitesse de rotation ou de centrifugation augmente. Veuillez respecter les indications du fabricant relatives à la charge maximale des tubes de centrifugation.

En cas de bris de verre, veuillez retirer immédiatement tous les éclats et le verre pulvérisé du rotor, des tubes, des adaptateurs et de l'espace de la centrifugeuse. Eventuellement, les plaques en caoutchouc et les adaptateurs doivent être changés, pour éviter davantage de dégâts.

Renvoi des appareils

Lors du renvoi de centrifugeuses, veuillez prendre garde à ce que les appareils soient entièrement décontaminés et qu’ainsi, ils ne présentent aucun risque pour la santé de notre personnel d’entretien.

Vous trouverez d’autres informations et un modèle de l’attestation de décontamination sous www.eppendorf.com. Pour obtenir des renseignements à propos de la méthode de décontamination appropriée, veuillez-vous adresser également au responsable de la sécurité de votre laboratoire.

Veuillez remplir l’attestation de décontamination et joignez-la complétée à l’appareil lorsque celui-ci doit être renvoyé à la société Eppendorf.

Mode d'emploi succinct

Tableau d'identification des anomalies

Anomalie	Origine	Remède
Aucun affichage.	Absence d'alimentation.	Vérifier le raccordement secteur (des deux côtés).
	Coupure secteur.	Contrôler les fusibles sur le tableau d'alimentation du laboratoire / sur l'appareil.
Couvercle impossible à ouvrir.	Coupure secteur.	Déverrouillage d'urgence
	Le rotor tourne encore.	Attendre l'arrêt complet du rotor.
Vibration de la centri-fugeuse au démarrage.	Le rotor est chargé de façon asymétrique.	Arrêter la centrifugeuse et rétablir la symétrie de charge.
Démarrage impossible de la centrifugeuse.	Couvercle non fermé.	Pousser fermement sur le couvercle.
Affichage: LID	Couvercle non verrouillé.	Pousser fermement sur le couvercle, actionner Start/ Stop ou le déverrouillage d'urgence.
	Couvercle non verrouillé.	Fermer à nouveau le couvercle.
Lo on (uniquement 5702)	Blocage des paramètres de centrifugation contre tout dérèglement.	Le couvercle de la centrifugeuse étant ouvert, appuyer simultanément sur SHORT et OPEN pendant 5 s si vous souhaitez modifier les paramètres.
P 1 **P 2**	Le programme 1 ou 2 est activé.	Appuyer sur la touche allumée du programme afin de quitter le niveau du programme (si souhaité).
FA	Indique une temporisation FAST TEMP.	Si nécessaire, la temporisation peut être interrompue via les touches START / STOP.
Inb	Charge irrégulière du rotor.	Contrôler la charge et renouveler la centrifugation.
Int	Coupure secteur durant le fonctionnement.	Contrôler le raccordement secteur. Attendre l'arrêt du rotor. Refaire un essai.
Er 2	étecteur de balourd défectueux.	Prendre contact avec le SAV.
Er 3	Système compte-tours défectueux.	Laisser reposer l'appareil sous tension jusqu'à ce que le message d'erreur s'efface (jusqu'à 5 min).
Er 5	Commutateur du couvercle.	Fermer à nouveau le couvercle.
Er 6	Entraînement défectueux.	Refaire un essai.
Er 7	Surrégime.	Erreur dans le système d'entraînement ou celui du compte-tours.
Er 8	Erreur d'entraînement.	Renouveler la centrifugation.
Er 9 – 25	Problème électronique.	Refaire un essai.
Er 18	Ecart de température > 5 °C par rapport à la valeur théorique.	Valeur théorique réglée trop faible ou refroidissement défectueux.
Er 19	Surchauffe du circuit de refroidissement.	Vérifier que la circulation de l'air à travers les fentes de refroidissement n'est pas entravée (distance latérale minimale 15 cm).
Er 23 (uniquement 5702)	Surchauffe du moteur.	Laisser refroidir le moteur.
Er 24	Erreur dans le groupe de refroidissement	Au début de la centrifugation : prendre contact avec le SAV. Après de nombreuses centrifugations : laisser refroidir la centrifugeuse.

Si aucune des mesures préconisées ci-dessus ne devait apporter de remède aux anomalies, il convient de faire appel au service après-vente. den Service.

EG-Konformitätserklärung
EC Conformity Declaration

Das bezeichnete Produkt entspricht den einschlägigen grundlegenden Anforderungen der aufgeführten EG-Richtlinien und Normen. Bei einer nicht mit uns abgestimmten Änderung des Produktes oder einer nicht bestimmungsgemäßen Anwendung verliert diese Erklärung ihre Gültigkeit.

The product named below fulfills the relevant fundamental requirements of the EC directives and standards listed. In the case of unauthorized modifications to the product or an unintended use this declaration becomes invalid.

Produktbezeichnung, Product name:

Centrifuge 5702 / 5702 R / 5702 RH

einschließlich Zubehör / including accessories

Produkttyp, Product type:

Laborzentrifuge / Laboratory Centrifuge

Einschlägige EG-Richtlinien/Normen, Relevant EC directives/standards:

2006/95/EG, EN 61010-1, EN 61010-2-20

2004/108/EG, EN 55011/B, EN 61000-6-1, EN 61000-3-2, EN 61000-3-3, EN 61326-1

98/79/EG, EN ISO 14971, EN 61010-2-101, EN 61326-2-6, EN 62366, EN ISO 18113-3

H.-G. Kühl

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Projektmanagement, Project Management:

15.01.2013

Hamburg, Date:

ISO CERTIFIED 9001

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CERTIFICATE OF COMPLIANCE

Certificate Number	20120416 – E215059
Report Reference	E215059 – 2002 February 28
Issue Date	2012 April 16
Issued to:	EPPENDORF ZENTRIFUGEN GMBH RIESAER STR 198 04319 LEIPZIG, GERMANY
This is to certify that representative samples of	Laboratory-use Electrical Equipment Centrifuge, Model 5702.
	Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.
Standard(s) for Safety:	ANSI/UL 61010-1, "Electrical Equipment for Measurement, Control and Laboratory Use - Part 1: General Requirements" and C22.2 No. 1010.1 (1992), "Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, Part I: General Requirements." Part 2: Particular Requirements for Laboratory Centrifuges, CAN/CSA-C22.2 No. 1010.2.020-92, CAN/CSA-C22.2 No. 1010.2.020A-97
Additional Information:	See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Listing Mark for the US and Canada should be considered as being covered by UL's Listing and Follow-Up Service meeting the appropriate requirements for US and Canada.
The UL Listing Mark for the US and Canada generally includes: the UL in a circle symbol with "C" and "US" identifiers: c(UL)us the word "LISTED"; a control number (may be alphanumeric) assigned by UL; and the product category name (product identifier) as indicated in the appropriate UL Directory.

Look for the UL Listing Mark on the product.

William R. Carney, Director, North American Certification Programs

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This is to certify that representative samples of	Laboratory-use Electrical Equipment Centrifuge, Model 5702R, 5703 and 5702RH, 5704.
	Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.
Standard(s) for Safety:	ANSI/UL 61010-1, "Electrical Equipment for Measurement, Control and Laboratory Use - Part 1: General Requirements" and C22.2 No. 1010.1 (1992), "Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, Part I: General Requirements." Part 2: Particular Requirements for Laboratory Centrifuges, CAN/CSA-C22.2 No. 1010.2.020-92, CAN/CSA-C22.2 No. 1010.2.020A-97
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William R. Carney, Director, North American Certification Programs

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5702 901.016-11/052013

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